

## CLAIMS

SUB  
A1

A medical imaging apparatus, comprising:

a first imaging device for obtaining one or more tomographic images of a subject patient, wherein at least a portion of the first imaging device has a first bore through which a patient axially translates during formation of one or more images by the device;

a second imaging device for obtaining one or more tomographic images of the subject patient, wherein at least a portion of the second imaging device has a second bore through which a patient axially translates during formation of the images by the device;

the first and second imaging devices, each secured by a housing in a fixed position relative to the other during the formation of one or more images of the subject patient, wherein the bore of each device is substantially aligned axially with the bore of the other; and

an actuating mechanism for moving the first and second imaging devices between an adjoining position, wherein a substantially continuous bore is formed by the first and second bores, and an open position, wherein the first and second bores are separated by a distance sufficient to allow direct access by a caregiver to a subject patient, positioned between the first and second bores.

2. An imaging apparatus having an imaging axis, comprising:

a first imaging device for obtaining one or more images of a patient, wherein the patient is substantially aligned with the imaging axis;

a second imaging device for obtaining one or more images of a patient, wherein the patient is substantially aligned with the imaging axis;

an alignment mechanism holding the first and second imaging devices in adjoining positions wherein the first and second imaging devices are fixed relative to each other and relative to the imaging axis; and

an actuating mechanism for separating the first and second imaging devices a distance sufficient to provide a caregiver line-of-sight visual contact with a patient that is aligned with the imaging axis and extends between the first and second imaging devices.

3. A medical imaging apparatus, comprising:  
a first tomographic medical imaging device having a first opening for receipt of a subject patient;  
a second tomographic medical imaging device having a second opening for receipt of  
5 the subject patient;  
alignment structure securing the openings of the first and second imaging devices in alignment with an imaging axis during the formation of one or more tomographic images, by at least one of the imaging devices, of the subject patient;  
a patient support structure extending through the openings of the first and second  
10 imaging devices during the formation of one or more images by at least one of the imaging devices; and  
an actuator for separating the first and second openings of the first and second imaging devices from each other by a selected distance.

15 4. The medical imaging apparatus of Claim 3, wherein the distance between the first and second openings allows direct tactile contact between a caregiver and the subject patient.

20 5. The medical imaging apparatus of Claim 3, wherein the distance between the first and second openings allows a caregiver to perform one or more interventional applications on the subject patient between the first and second imaging devices.

25 6. The medical imaging apparatus of Claim 5, wherein the distance between the first and second openings allows a caregiver to perform at least a portion of a biopsy procedure on the subject patient.

7. The medical imaging apparatus of Claim 3, wherein the first imaging device comprises one of a group consisting of CT, MRI, X-Ray, and Ultrasound devices.

8. The medical imaging apparatus of Claim 3 or 7, wherein the second imaging device comprises one of a group consisting of SPECT and PET devices.

9. The medical imaging apparatus of Claim 3, wherein the axes of the first and second openings of the first and second imaging devices are substantially aligned.

10. The medical imaging apparatus of Claim 3, wherein the alignment structure comprises a lug mounted on the first imaging device engaging socket mounted on the second imaging device.

11. A medical imaging apparatus, comprising:  
a first housing supporting a first tomographic scanner having a first bore for obtaining tomographic imaging information from at least a portion of a patient;  
a second housing supporting a second tomographic scanner having a bore for obtaining tomographic imaging information from at least a portion of a patient; and  
a linear actuator for positioning each of the first and second housings between an adjoined position, with the axes of the first and second scanner bores substantially aligned, and a separated position, with the scanner bores spaced from each other by the linear actuator.

12. The medical imaging apparatus of Claim 11, wherein the first and second housings form a patient access area between the first and second scanners bores when placed in the adjoining position, the access area allowing direct access by a caregiver to a patient extending through the first scanner bore and at least partially positioned between the first and second scanners.

13. The medical imaging apparatus of Claim 11, wherein the linear actuator comprises:  
a guide rail substantially aligned with the axes of the first and second bores; and

a drive assembly for moving at least one of the first and second housings relative to the other housing in a direction substantially aligned with the axes of the first and second bores.

5        14.    The medical imaging apparatus of Claim 11, wherein the first and second scanners are adapted to operate in different modalities with respect to each other.

10       15.    The medical imaging apparatus of Claim 14, wherein one of the first and second scanners is adapted to obtain imaging information representing anatomical structures of the patient.

15       16.    The medical imaging apparatus of Claim 14 or 15, wherein one of the first and second scanners is adapted to obtain imaging information representing physiologic functions of the patient.

20       17.    A medical imaging method, comprising:  
         providing a first housing supporting a first tomographic scanner having a first bore for obtaining tomographic imaging information from at least a portion of a patient;  
         providing a second housing supporting a second tomographic scanner having a bore for obtaining tomographic imaging information from at least a portion of a patient;  
         connecting the first and second housings by an actuator; and  
         actuating the actuator to position each of the first and second housings between an  
         adjoining position, with the axes of the first and second scanner bores substantially aligned,  
         and a separated position, with the scanner bores spaced from each other by the linear  
25       actuator.

30       18.    The medical imaging method of Claim 17, further comprising operating the first and second scanners in different modalities with respect to each other when the first and second scanners are in the adjoining position to obtain imaging information from the patient.

19. The medical imaging method of Claim 18, further comprising operating one of the first and second scanners in a modality obtaining imaging information representing anatomical structures of the patient when in the first and second scanners are in the separated position.

5

20. The medical imaging method of Claim 17, further comprising forming a patient access area between the first and second scanners bores when the first and second housings are placed in the adjoining position, the access area allowing direct access by a caregiver to a patient extending through the first scanner bore and at least partially positioned between the first and second scanners.

10

21. The medical imaging method of Claim 18, further comprising operating one of the first and second scanners in a modality obtaining imaging information representing physiologic functions of the patient.

15